

Assignment Sheet / Density Test

Project Number : 23502-ZS9 Lab. Tech : K. Ford
Project Name : HSR Date Completed : 11/26/13
Date Drilled : 10/25/13 Boring : S0073R

Depth	Tests	Soil Wt	Length	Diameter	Wet Wt	Dry Wt	Wet	Moisture	Dry	Soil
		Gms	in	in	Gms	Gms	Density	%	Density	Classification
	CHEM,PH,MR,CU									
0-5'	RV,CBR									MH
5.5-6'	DD,PI	863.4	6.00	2.42	200	155.8	119.2	28.4%	92.9	ML
6-6.5'										CL
					50	39.7		25.9%		ML
12-14'	BERKLEY									
16-16.5'	DD,PI	901.0	6.00	2.42	200	166.1	124.4	20.4%	103.3	CL
26-26.5'	PI,TRX									
31-31.5'	DD,PI				50	42.3		18.2%		ML
41-41.5'	DD,PI				50	42.9		16.6%		ML
46-46.5'	TRX									
51-51.5'	DD,HY,SA				40	33.3		18.9%		SM/CL
66-66.5'	TRX									
71-71.5'	DD,PI				50	41.3		21.1%		MH
										<u> </u>
										<u> </u>
	0-5' 5.5-6' 6-6.5' 11-11.5' 12-14' 16-16.5' 26-26.5' 31-31.5' 41-41.5' 46-46.5' 51-51.5' 66-66.5'	CHEM,PH,MR,CU 0-5' RV,CBR 5.5-6' DD,PI 6-6.5' 11-11.5' DD,PI 12-14' BERKLEY 16-16.5' DD,PI 26-26.5' PI,TRX 31-31.5' DD,PI 41-41.5' DD,PI 46-46.5' TRX 51-51.5' DD,HY,SA 66-66.5' TRX	Gms CHEM,PH,MR,CU RV,CBR 5.5-6' DD,PI 863.4 6-6.5' 11-11.5' DD,PI 12-14' BERKLEY 16-16.5' DD,PI 901.0 26-26.5' PI,TRX 31-31.5' DD,PI 41-41.5' DD,PI 46-46.5' TRX 51-51.5' DD,HY,SA 66-66.5' TRX	Gms in CHEM,PH,MR,CU RV,CBR 5.5-6' DD,PI 863.4 6.00 6-6.5' 11-11.5' DD,PI 12-14' BERKLEY 16-16.5' DD,PI 901.0 6.00 26-26.5' PI,TRX 31-31.5' DD,PI 41-41.5' DD,PI 46-46.5' TRX 51-51.5' DD,HY,SA 66-66.5' TRX	Gms in in in	CHEM,PH,MR,CU RV,CBR Sin Sin	Gms in in Gms Gms 0-5' RV,CBR	Gms in in Gms Density 0-5' CHEM,PH,MR,CU RV,CBR 5.5-6' DD,PI 863.4 6.00 2.42 200 155.8 119.2 6-6.5' <t< td=""><td>Gms in in Gms Density % CHEM,PH,MR,CU RV,CBR BD,PI 863.4 6.00 2.42 200 155.8 119.2 28.4% 6-6.5' DD,PI 50 39.7 25.9% 25.9% 12-14' BERKLEY 50 39.7 25.9% 16-16.5' DD,PI 901.0 6.00 2.42 200 166.1 124.4 20.4% 26-26.5' PI,TRX 50 42.3 18.2% 41-41.5' DD,PI 50 42.9 16.6% 46-46.5' TRX 40 33.3 18.9% 66-66.5' TRX 40 33.3 18.9%</td><td> CHEM,PH,MR,CU RV,CBR Sequence Sequen</td></t<>	Gms in in Gms Density % CHEM,PH,MR,CU RV,CBR BD,PI 863.4 6.00 2.42 200 155.8 119.2 28.4% 6-6.5' DD,PI 50 39.7 25.9% 25.9% 12-14' BERKLEY 50 39.7 25.9% 16-16.5' DD,PI 901.0 6.00 2.42 200 166.1 124.4 20.4% 26-26.5' PI,TRX 50 42.3 18.2% 41-41.5' DD,PI 50 42.9 16.6% 46-46.5' TRX 40 33.3 18.9% 66-66.5' TRX 40 33.3 18.9%	CHEM,PH,MR,CU RV,CBR Sequence Sequen

Notes:

CHEM Sulfate/Chloride MR Minimum Resistivity
COLL Collapse PH pH Test

CONSOL 1D Consolidation PI Atterberg Limits

CURV Modified Proctor RV R-value

DD Moisture Density RVT R-value Treated
DS Direct Shear SA Sieve Analysis
HY Hydrometer TRX Triaxial Compression

MOISTURE & DENSITY TEST ISI Lab No.: G-52923 Client: URS/ARUP/HMM JV California High Speed Train 2636-001.0 Project: Job no: Boring # S0073R Sample # MC15-2 Depth (ft.) 65.5-66.0 Soil type: (visual) Grayish brown fat clay 1. Date tested: 01/15/14 2. Tested by: JΗ 3. Specimen height (in.) 5.07 4. Wt. of specimen + tare (gm) 761.54 5. Tare wt. (gm) 0.00 2.41 6. Diameter (in.) 7. Wet wt. of soil + dish wt. (gm) 197.27 8. Dry wt. of soil + dish wt. (gm) 167.76 9. Wt. of dish (gm) 51.10 9. 10. Dish ID 10. Wet Density (pcf) 125.3 Dry Density (pcf) 100.0 **Moisture Content (%)** 25.3 Gs (Assumed) 2.70 Void Ratio 0.684 Saturation (%) 99.8 Additional data: Wt. of dry soil + dish before washing (gm) Wt. of dry soil + dish after washing (gm) % Passing # 200 sieve USCS symbol



Assignment Sheet / Density Test

Project Number : 23502-ZS9 Lab. Tech : K. Ford Project Name : HSR Date Completed : 1/20/14 Date Drilled : 1/8/14

Boring	Sample	Depth	Tests	Soil Wt	Length	Diameter	Wet Wt	Dry Wt	Wet	Moisture	Dry	Soil
				Gms	in	in	Gms	Gms	Density	%	Density	Classification
S0019AR	MC03-2	15.5-16'	SA				200	174.1		14.9%		SP
S0019AR	SS06	30-31.5'	SA				200	181.5		10.2%		SM/SP
S0020R	SS07	25-26.5'	SA				200	167.7		19.3%		SM
S0021R	MC10-1	46-46.5'	SA				200	180.2		11.0%		SM/ML
S0021R	MC18-1	86-86.5'	SA				200	184.8		8.2%		SP
S0021R	SS07	30-31.5'	SA				200	171.3		16.8%		SM/SP
S0029R	MC08-1	30.9-31.4'	SA				200	174.1		14.9%		SM
S0031R	MC03-2	10.4-11	SA				200	166.5		20.1%		SP
S0031R	SS08	35-36.5'	SA				200	175.4		14.0%		SM
S0034BR	MC09-1	41-41.5'	HY,SA									SM/ML
S0065R	MC04-2	15.5-16'	SA				200	172.6		15.9%		SM/SP
S0066R	MC03-2	10-11.5'	SA				200	172.0		16.3%		SM
S0067R	MC06-1	25-26.5'	SA				200	169.4		18.1%		SP
S0067R	MC11-1	45-46.5'	HY,SA									SM
S0067R	MC23-1	95-96.4'	HY,SA									SM
S0070R	MC09-2	40.5-41'	HY,SA									SM
S0070R	U05	20-22'	HY,SA									SM
S0072R	MC12-1	51-51.5'	HY,SA									SM/ML
S0073R	MC11-2	45.5-46'	HY,SA									ML/CL
			<u> </u>									

Notes:

CHEM Sulfate/Chloride Minimum Resistivity MR COLL Collapse РΗ pH Test Ы CONSOL 1D Consolidation Atterberg Limits Modified Proctor RV CURV R-value DD Moisture Density RVT R-value Treated DS **Direct Shear** SA Sieve Analysis HY Hydrometer TRX **Triaxial Compression**

MOISTURE & DENSITY TEST ISI Lab No.: G-52923 Client: URS/ARUP/HMM JV Project: California High Speed Train Job no: 2636-001.0 S0071R S0072R S0072R S0073R Boring # Sample # MC03-2 MC10-2 MC22-1 MC15-2 Depth (ft.) 40.5-41.0 65.5-66.0 10.5-11.0 101.0-101.5 Soil type: (visual) Olive brown clay Olive brown sandy Olive gray clay Grayish brown fat with sand clay clay 01/16/14 01/15/14 1. Date tested: 01/16/14 01/16/14 2. Tested by: JH JΗ JH JΗ 3. Specimen height (in.) 5.70 5.69 5.07 5.70 4. Wt. of specimen + tare (gm) 827.13 911.75 809.21 761.54 5. Tare wt. (gm) 0.00 0.00 0.00 0.00 2.41 2.41 6. Diameter (in.) 2.41 2.42 7. Wet wt. of soil + dish wt. (gm) 278.22 330.48 269.70 197.27 8. Dry wt. of soil + dish wt. (gm) 228.86 287.82 216.15 167.76 51.10 9. Wt. of dish (gm) 50.79 51.23 50.95 9. 10. Dish ID 10. Wet Density (pcf) 121.1 133.7 117.5 125.3 Dry Density (pcf) 94.8 113.3 88.7 100.0 **Moisture Content (%)** 27.7 18.0 32.4 25.3 Gs (Assumed) 2.70 2.70 2.70 2.70 2.70 2.70 2.70 2.70 Void Ratio 0.777 0.487 0.899 0.684 Saturation (%) 96.3 99.8 99.9 97.4 Additional data: Wt. of dry soil + dish before washing (gm) Wt. of dry soil + dish after washing (gm) % Passing # 200 sieve USCS symbol



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 1/14/2014

 Boring No.:
 S0073R
 Depth, ft
 45.5-46'

 Sample No.:
 MC11-2
 Classification:
 (ML/CL) Clayey Silt

	Weight (grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.	, σ	Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	73.7	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	73.7	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	14.1	2"	44.0 (20.0)

	Individual	Individual	Combined	Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.4	0.5	0.5	99.5	
#10	0.3	0.4	1.0	99.0	
#16	0.2	0.3	1.2	96.9	
#30	3.0	4.1	5.3	94.7	
#40	1.0	1.4	6.7	93.4	
#50	1.4	1.9	8.6	91.5	
#100	3.0	4.1	12.6	87.5	
#200	4.5	6.1	18.7	81.4	
Pan					



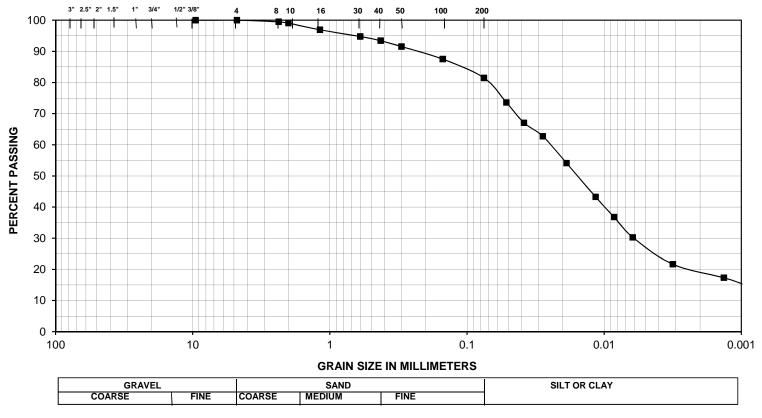
HYDROMETER TEST DATA SUMMARY ASTM D 422-63

			RE_BAK			TES # : S0073R		
Boring Number		S007	73R	_		DATE:	1/14/2014	
Sample Depth,	ft	45.5	-46'	Sample No.:	MC11-2	TESTED BY: I	K. Ford	
Mass of Test Sa	ample a		75.00	"air-dried"	٦	Hydrometer Type	151H	
			30.00	"air-dried"	-	riyurumeter rype_		
	copic Sample, g				On a sifin One site of	A Tank Makawial	0.050	
	copic Sample, g		29.46	"oven-dried"	Specific Gravity		2.650	
Mass of Test Sa	ample, g		73.65	"oven-dried"	Specific Gravity	of Test Solution	Varies	
				_				
Time	Hydrometer	Corrected	Temperature	Effective Depth	Constant, K	Diameter, D	Amt. Suspended, P	
(min.)	Reading	Reading	Degrees C	Table 2 (cm)	Table 3	(mm)	(%)	
0.5	1.036	1.034	21	7.3	0.01348	0.0515	74.2	
1	1.033	1.031	21	8.1	0.01348	0.0384	67.7	
2	1.031	1.029	21	8.6	0.01348	0.0280	63.3	
5	1.027	1.025	21	9.7	0.01348	0.0188	54.6	
15	1.022	1.020	21	11.0	0.01348	0.0115	43.7	
30	1.019	1.017	21	11.8	0.01348	0.0085	37.1	
60	1.016	1.014	21	12.6	0.01348	0.0062	30.6	
250	1.012	1.010	21	13.7	0.01348	0.0032	21.8	
1440	1.010	1.008	21	14.2	0.01348	0.0013	17.5	
2880	1.009	1.007	21	14.4	0.01348	0.0010	15.3	



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



45.5-46

Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	PI	Project:	CA HSR FRE_BAK
MC11-2	(ML/CL) Clayey Silt	0	18.7	52.7	28.6	1.8					
										TES#:	23502-ZS9
										Boring#:	S0073R
										Date:	1/14/2014

^{*} Particles smaller than 5 Micron in diameter



Construction Testing & Inspection * Geotechnical & Environmental Engineering

Sieve Analysis for Soil and Fine Aggregate

 Project:
 CA HSR FRE_BAK
 Technician:
 K. Ford

 TES#:
 23502-ZS9
 Date:
 11/12/2013

 Boring No.:
 50073R
 Depth, ft
 51-51.5'

 Sample No.:
 SS12
 Classification:
 (SM) Silty Sand

	Weight (grams)	Maximum Sieve Size	Minimum Weight of Test Specimen, lbs. (kg)
Total Dry Sample + Tare Wt.	, σ	Sand	1.0 (0.5)
Tare Weight		3/8"	2.0 (1.0)
Total Dry Sample Wt.	73.9	1/2"	4.0 (2.0)
Initial Weight Fine		3/4"	11.0 (5.0)
Soil Before Wash	73.9	1"	22.0 (10.0)
Final Weight Fine		1 1/2"	33.0 (15.0)
Soil After Wash	45.6	2"	44.0 (20.0)

	Individual	Individual	Combined	Combined	
Sieve	Weight	%	%	%	
Size	Retained	Retained	Retained	Passing	Specs.
3 in.	0.0	0.0	0.0	100.0	
2 1/2 in.	0.0	0.0	0.0	100.0	
2 in.	0.0	0.0	0.0	100.0	
1 1/2 in.	0.0	0.0	0.0	100.0	
1 in.	0.0	0.0	0.0	100.0	
3/4 in.	0.0	0.0	0.0	100.0	
1/2 in.	0.0	0.0	0.0	100.0	
3/8 in.	0.0	0.0	0.0	100.0	
#4	0.0	0.0	0.0	100.0	
#8	0.0	0.0	0.0	100.0	
#10	0.0	0.0	0.0	100.0	
#16	0.2	0.3	0.3	100.0	
#30	0.7	0.9	1.2	98.8	
#40	1.1	1.5	2.7	97.3	
#50	3.5	4.7	7.4	92.6	
#100	16.8	22.7	30.2	69.8	
#200	20.3	27.5	57.7	42.3	
Pan					



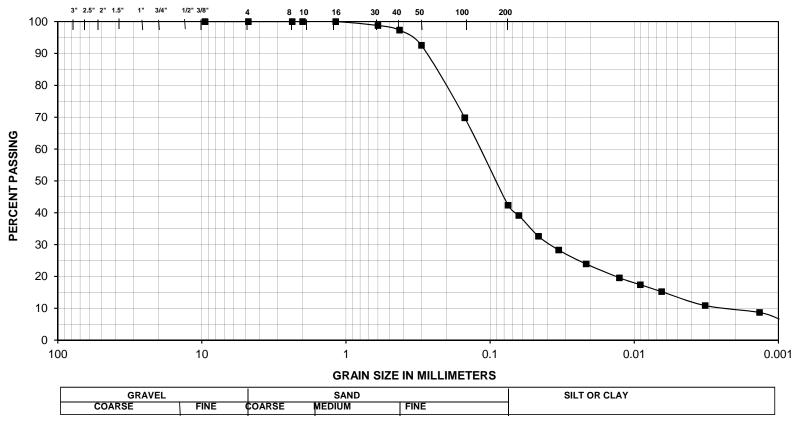
HYDROMETER TEST DATA SUMMARY ASTM D 422-63

PROJECT:		CA HSR F	RE_BAK			TES#:	S0073R
Boring Number		S007	73R			DATE:	11/12/2013
Sample Depth	, ft	51-5	1.5'	Sample No.:	SS12	TESTED BY:	K. Ford
					7		
Mass of Test S			75.00	"air-dried"	_	Hydrometer Type	151H
, ,	scopic Sample, g		19.47	"air-dried"			
Mass of Hygro	scopic Sample, g		19.18	"oven-dried"	Specific Gravity of	of Test Material	2.650
Mass of Test S	Sample, g		73.88	"oven-dried"	Specific Gravity of	of Test Solution	Varies
Time	Hydrometer	Corrected	Temperature	Effective Depth	Constant, K	Diameter, D	Amt. Suspended, P
(min.)	Reading	Reading	Degrees C	Table 2 (cm)	Table 3	(mm)	(%)
0.5	1.019	1.018	23	11.5	0.01317	0.0632	39.2
1	1.016	1.015	23	12.3	0.01317	0.0462	32.6
2	1.014	1.013	23	12.9	0.01317	0.0334	28.3
5	1.012	1.011	23	13.4	0.01317	0.0216	23.9
15	1.010	1.009	23	13.9	0.01317	0.0127	19.6
30	1.009	1.008	23	14.2	0.01317	0.0091	17.4
60	1.008	1.007	23	14.4	0.01317	0.0065	15.2
250	1.006	1.005	23	15.0	0.01317	0.0032	10.9
1440	1.005	1.004	23	15.2	0.01317	0.0014	8.7
2880	1.004	1.003	23	15.5	0.01317	0.0010	6.5



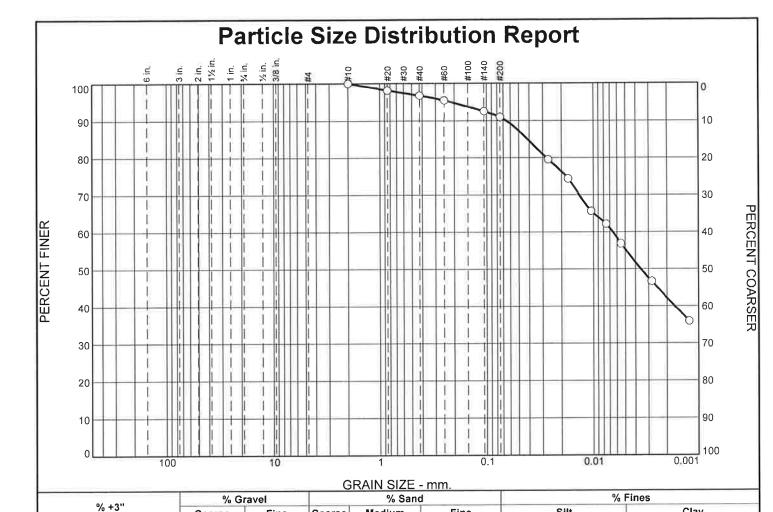
U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS



Sample #	Classification	% Gravel	% Sand	% Silt	% Clay*	% Moist.	LL	PL	PΙ	Project:	CA HSR FRE_BAK
51-51.5'	(SM) Silty Sand	0	57.7	28.5	13.9	1.5					
										TES#:	S0073R
										Boring#:	SS12
										Date:	11/12/2013

^{*} Particles smaller than 5 Micron in diameter



Medium

Fine

SIEVE	PERCENT	SPEC.*	PASS?
SIZE	FINER	PERCENT	(X=NO)
#10	100		
#20	98		
#40	97		
#60	96		
#140	93		
#200	91		
0.0267 mm.	80		
0.0174 mm.	74		
0.0106 mm.	66		
0.0076 mm.	62		
0.0055 mm.	57		
0.0028 mm.	47		
0.0012 mm.	36		

Coarse

_		26							
3	6	36	55						
Gı	Soil Description Grayish brown fat clay								
Pl	_= 22	Atterberg Limits LL= 67	PI= 45						
D ₀	90= 0.0653 50= 0.0036 10=	Coefficients D85= 0.0414 D30= Cu=	D ₆₀ = 0.0066 D ₁₅ = C _c =						
U	SCS= CH	Classification AASHTO=	A-7-6(45)						
F.J	M.=0.14	Remarks							

Silt

Clay

(no specification provided)

Source of Sample: S0073R G-52923 **Sample Number:** MC15-2

0

Depth: 65.5-66.0

Coarse

Fine

0

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Project No: 2636-001.0

Figure

Date: 1/17/14

Checked By: PH Tested By: JH



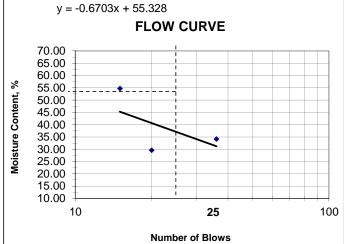
Project Name:	et Name: HSR		o.: S0073R		Project No.: 23502-ZS9			
Sample No:	MC02-2	Depth:	5.5-6.0'	Date:	11/26/13	Tested By: K.F		
Soil Classification:	(ML) Sandy Silt							

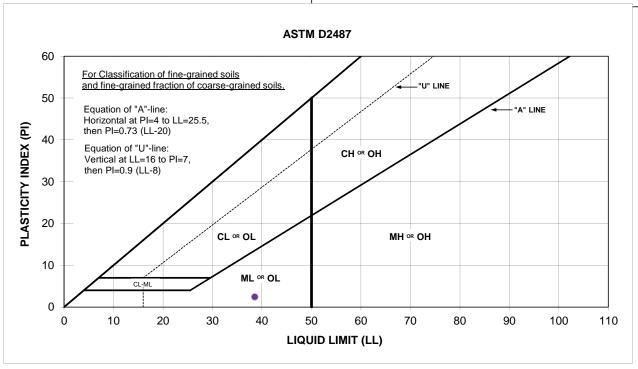
	LIQUID LIMIT							
A Tes No.	1	2	3	No. of Blows	15	20	36	
B Tare No.	1	2	3		1	2	3	
C Mass of Pan + Dry Soil, g	21.00	20.96	20.98		30.63	24.37	30.75	
D Mass of Pan + Wet Soil, g	21.11	21.08	21.12		31.85	25.46	31.59	
E Mass of Pan, g	20.69	20.55	20.66		28.40	20.68	28.29	
F Mass of Water, g	0.11	0.12	0.14	0.00	1.22	1.09	0.84	
G Mass of Dry Soil, g	0.31	0.41	0.32		2.23	3.69	2.46	
H Moisture Content, %	35.48	29.27	43.75		54.71	29.54	34.15	

I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	38.6
Plastic Limit: Line I	36.2
Plasticity Index: Pl = LL - PL	2.4







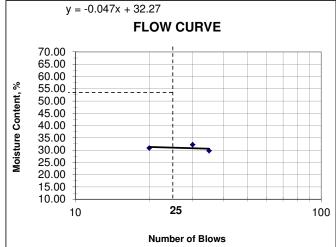
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Sample No:	SS03	Depth:	11-11.5'	Date:	11/26/13	Tested By: K.F		
Soil Classification:	(ML) Sandy Silt							

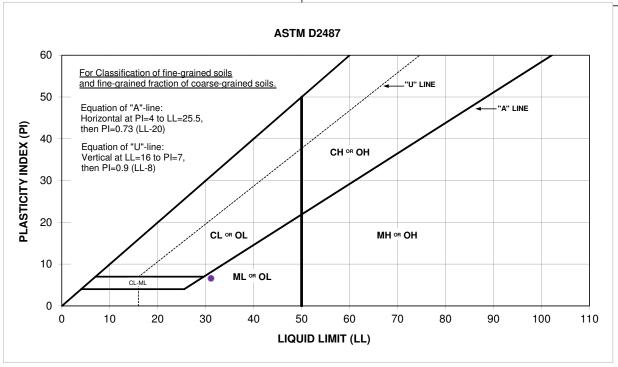
i	LIQUID LIMIT							
A Tes No.	1	2	3	No. of Blows	35	20	30	
B Tare No.	1	2	3		1	2	3	
C Mass of Pan + Dry Soil, g	22.40	30.20	22.60		35.80	27.60	34.30	
D Mass of Pan + Wet Soil, g	22.80	30.60	23.10		38.00	29.70	36.20	
E Mass of Pan, g	20.70	28.50	20.70		28.40	20.80	28.40	
F Mass of Water, g	0.40	0.40	0.50	0.00	2.20	2.10	1.90	
G Mass of Dry Soil, g	1.70	1.70	1.90		7.40	6.80	5.90	
H Moisture Content, %	23.53	23.53	26.32		29.73	30.88	32.20	

I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	31.1
Plastic Limit: Line I	24.5
Plasticity Index: Pl = LL - PL	6.6





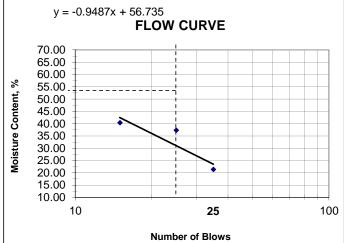


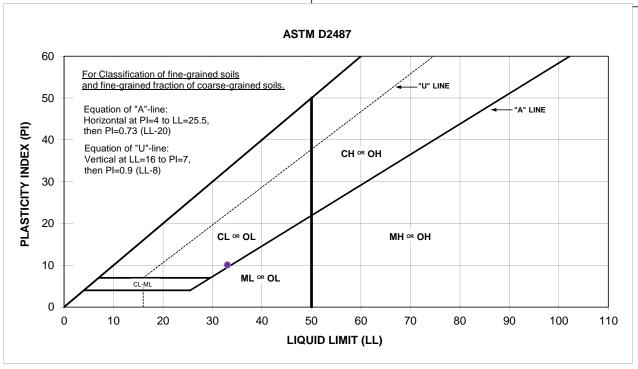
Project Name:	HSR	Boring No	o.: S0073R	Project No.: 23502-ZS9			
Sample No:	MC05-1	Depth:	16-16.5'	Date:	11/26/13	Tested By: K.F	
Soil Classification:	(CL) Sandy Silty Clay						

I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	33.0
Plastic Limit: Line I	23.0
Plasticity Index: Pl = LL - PL	10.1





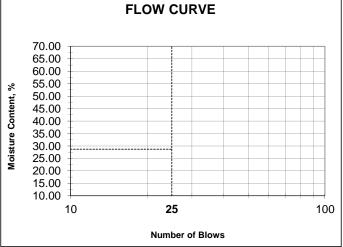


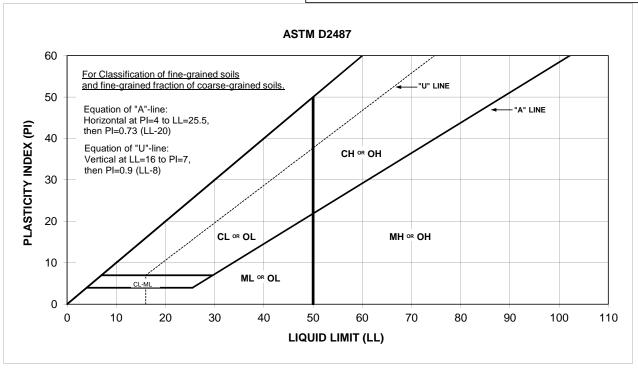
Project Name:	HSR			Project No.: 23502-ZS9			
Soil Boring No:	S0073R	Depth:	26.5' - 27.0' Date:	12/2/13	Tested By: R. Lorenz		
Sample No.:	MC7-2				Classification: (SM) Silty Sand		

		1		
A Tes No.	1	2	3	No. of Blows
B Tare No.				
C Mass of Pan + Dry Soil, g				
D Mass of Pan + Wet Soil, g				
E Mass of Pan, g				
F Mass of Water, g				
G Mass of Dry Soil, g				
H Moisture Content, %				
I Average Moisture Content, % (PL)			

	LIQUIE	LIMIT	
;			

Liquid Limit: Read from graph	
Plastic Limit: Line I	
Plasticity Index: Pl = LL - PL	Nonplastic







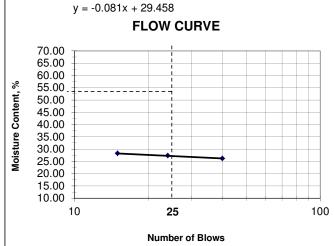
Project Name:	HSR	Boring No	o.: S0073R			Project No.: 23502-ZS9	
Sample No:	SS08	Depth:	31-31.5'	Date:	11/26/13	Tested By: K.F	
Soil Classification:	(ML) Sar	ndy Silt					

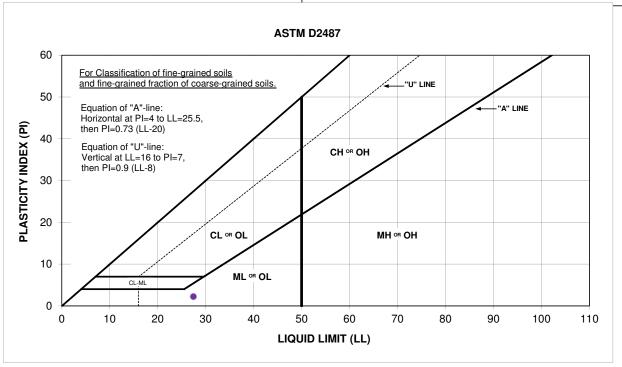
		PLASTIC LIMIT				LIQUIE	LIMIT	
A Tes No.	1	2	3	No. of Blows	15	40	24	
B Tare No.	1	2	3		1	2	3	
C Mass of Pan + Dry Soil, g	31.30	30.50	30.50		33.70	28.90	34.60	
D Mass of Pan + Wet Soil, g	32.10	31.10	31.00		35.20	31.00	36.30	
E Mass of Pan, g	28.00	28.40	28.30		28.40	20.90	28.40	
F Mass of Water, g	0.80	0.60	0.50	0.00	1.50	2.10	1.70	
G Mass of Dry Soil, g	3.30	2.10	2.20		5.30	8.00	6.20	
H Moisture Content, %	24.24	28.57	22.73		28.30	26.25	27.42	
			· · · · · · · · · · · · · · · · · · ·					

I Average Moisture Content, % (PL)

25.18 42.1795

Liquid Limit:	27.4
Plastic Limit: Line I	25.2
Plasticity Index: Pl = LL - PL	2.3







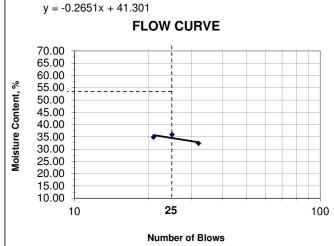
Project Name:	HSR	Boring No	o.: S0073R			Project No.: 23502-ZS9	
Sample No:	SS10	Depth:	41-41.5	Date:	11/26/13	Tested By: K.F	
Soil Classification:	(ML) Sar	ndy Silt					

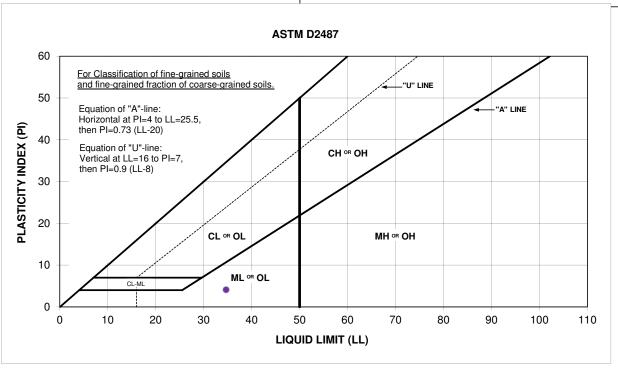
		PLASTIC LIMIT	_	,		LIQUIE	LIMIT	
A Tes No.	1	2	3	No. of Blows	21	25	32	
B Tare No.	1	2	3		1	2	3	
C Mass of Pan + Dry Soil, g	28.61	28.55	28.59		30.26	24.17	23.61	
D Mass of Pan + Wet Soil, g	28.65	28.61	28.69		30.92	25.36	24.49	
E Mass of Pan, g	28.35	28.41	28.29		28.37	20.86	20.89	
F Mass of Water, g	0.04	0.06	0.10	0.00	0.66	1.19	0.88	
G Mass of Dry Soil, g	0.26	0.14	0.30		1.89	3.31	2.72	
H Moisture Content, %	15.38	42.86	33.33		34.92	35.95	32.35	

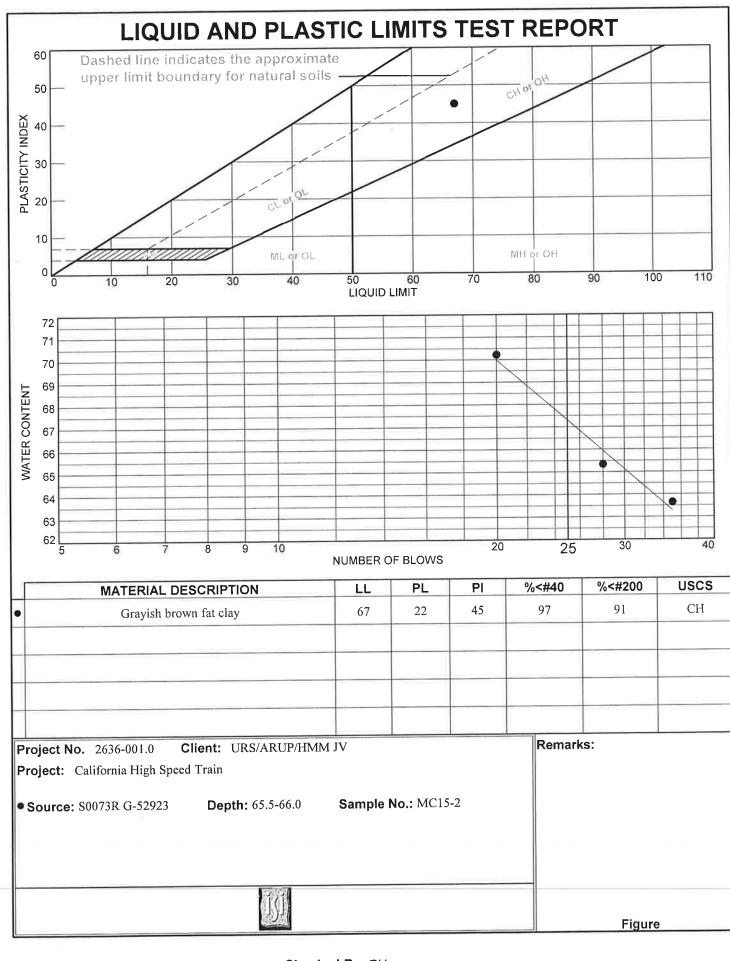
I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	34.7
Plastic Limit: Line I	30.5
Plasticity Index: Pl = LL - PL	4.1







Tested By: JH

Checked By: PH



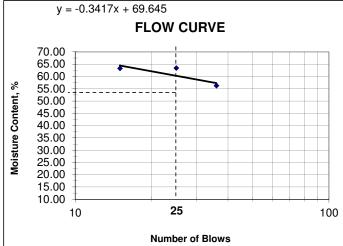
Project Name:	HSR	Boring No	o.: S0073R			Project No.: 23502-ZS9	
Sample No:	SS16	Depth:	71-71.5'	Date:	11/26/13	Tested By: K.F	
Soil Classification:	(MH) He	avy Silt					

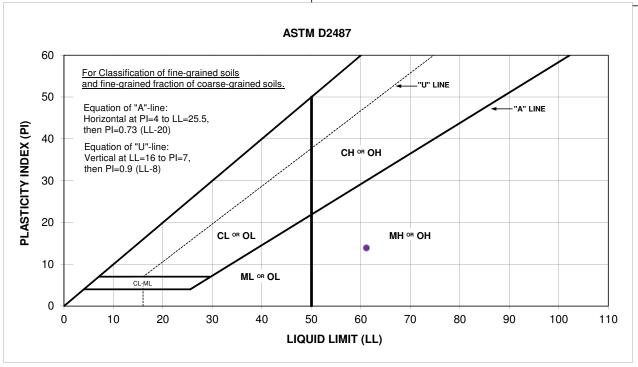
		PLASTIC LIMIT	-			LIQUIE	LIMIT	
A Tes No.	1	2	3	No. of Blows	36	25	15	
B Tare No.	1	2	3		1	2	3	
C Mass of Pan + Dry Soil, g	28.26	28.51	28.86		29.31	30.32	24.59	
D Mass of Pan + Wet Soil, g	28.30	28.61	29.02		29.85	31.29	27.11	
E Mass of Pan, g	28.10	28.31	28.62		28.35	28.79	20.61	
F Mass of Water, g	0.04	0.10	0.16	0.00	0.54	0.97	2.52	
G Mass of Dry Soil, g	0.16	0.20	0.24		0.96	1.53	3.98	
H Moisture Content, %	25.00	50.00	66.67		56.25	63.40	63.32	
			· · · · · · · · · · · · · · · · · · ·					

I Average Moisture Content, % (PL)

42.1795

Liquid Limit:	61.1
Plastic Limit: Line I	47.2
Plasticity Index: Pl = LL - PL	13.9





UNCONSOLIDATED UNDRAINED COMPRESSION TEST - ASTM D2850

Client: URS/ARUP/HMM JV

Project: California High Speed Train

Job # : 2636-001.0 Data Reduction:

Boring # S0073R

 Sample # : U04
 Dial factor = 1.0 in/unit

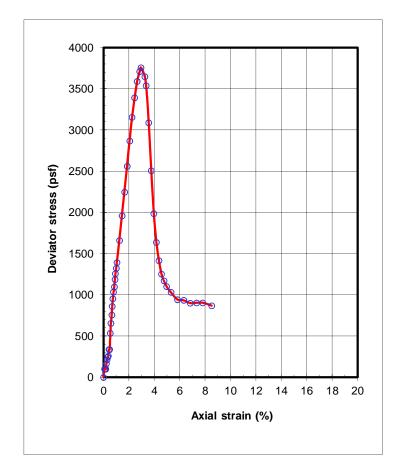
 Depth (ft) : 12-14
 Load factor = 1.0 lb/unit

Date tested: 11/23/13

Soil: Grayish brown sandy clay (slight slickensides)

Specimen:	Total wt. =	1358.5	gms
	Ht. =	6.180	in
	Ave dia. =	2.877	in
	Area =	6.502	sq.in
	Volume =	658.5	c.c.
S	hearing rate =	0.03	inch/min
S	Shearing rate =	0.5	%/min
G	s (assumed) =	2.70	
Test Re	•	Void ratio=	0.591

est Report:	Void ratio=	0.591	
	Ht/Dia ratio =	2.15	
	Moisture =	21.6	%
	Total density=	128.7	pcf
	Dry density =	105.9	pcf
	Saturation =	98.6	%
	Chamber pressure=	2160	psf
	Max. deviator stress=	3759	psf
	Strain @ failure=	2.95	%



0.022	11.9	0.50	202.1
0.025	15.3	0.43	338.3
0.028	15.3	0.49	338.1
0.031	24.4	0.54	537.6
0.034	29.9	0.59	657.8
0.038	34.4	0.64	756.5
0.041	39.1	0.69	860.2
0.044	43.5	0.74	955.9
0.047	47.1	0.79	1035.1
0.050	50.0	0.84	1098.7
0.053	54.1	0.89	1188.1
0.056	57.4	0.94	1259.2
0.060	60.3	1.00	1322.8
0.063	63.7	1.05	1395.2
0.075	76.0	1.25	1662.4
0.088	89.7	1.45	1958.9
0.100	103.2	1.65	2247.6
0.113	117.8	1.85	2561.4
0.125	132.2	2.05	2868.5
0.137	145.8	2.25	3157.5
0.150	157.0	2.45	3391.0
0.162	166.6	2.65	3592.4
0.174	172.5	2.85	3710.9
0.181	174.9	2.95	3759.1
0.199	170.3	3.25	3649.0
0.205	165.5	3.35	3541.5
0.218	144.6	3.55	3089.2
0.230	117.7	3.75	2509.2
0.243	93.5	3.95	1988.5
0.255	77.3	4.16	1640.1
0.267	66.9	4.36	1417.6
0.280	59.2	4.56	1252.3
0.292	55.6	4.76	1171.9
0.305	52.5	4.96	1104.3
0.326	49.2	5.31	1030.9
0.357	45.3	5.81	944.5
0.388	45.0	6.31	934.0
0.419	43.7	6.81	901.6
0.450	44.1	7.31	904.6
0.481	44.4	7.81	905.7
0.524	43.0	8.51	870.9

Axial

Strain

(%)

0.00

0.08

0.13

0.18

0.23

0.28

0.33

0.38

Dial

-0.002

0.003

0.006

0.009

0.012

0.015

0.019

0.022

Read.

Load Read.

4.6

4.6

4.6

7.6

9.7

11.9

11.1

Deviator

Stress

(psf)

0.0

101.2

101.2

101.1

168.9

214.0

244.2











ASTM D2850

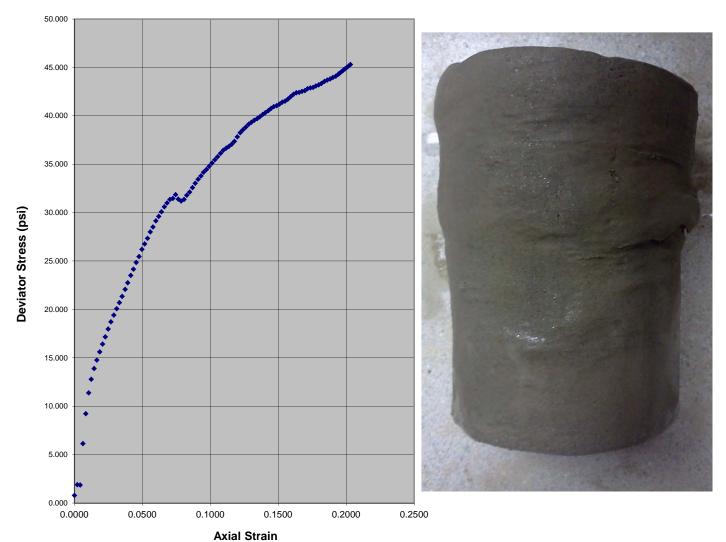
PROJECT	CA HST	
BORING # 5	80073R; MC-7-1 Depth (ft)	26
DESCRIPTION	ON (CL) Sandy Clay	

TES #	23502-ZS9	
Test Date	11/11/2013	
Tested By	D. Carruba	

Sample and Test Parameters

Wt. Specimen Wet + Tare (gm)	784.7	Water Content %	19.4	Diameter, D ₀ , (in)	2.42
Wt. Specimen Dry + Tare (gm)	657.2	Wt. Tare (gm)	0	Area, A ₀ , (in ²)	4.60
Wt. Water (gm)	127.5	Unit Wt. Wet (pcf)	132.1	Height, H_0 , (in)	4.92
Wt. Speciment Dry (gm)	657.2	Unit Wt. Dry (pcf)	110.6	Volume, V ₀ , (in ³)	22.63
Rate, in/min	0.05	Rate, %/min	1.00	Saturation, %*	100.2
Cell Pressure, psi	30	Axial Strain, %	20.31%	Deviator Stress, psi	45.30

*S.G. assumed 2.70





ASTM D2850

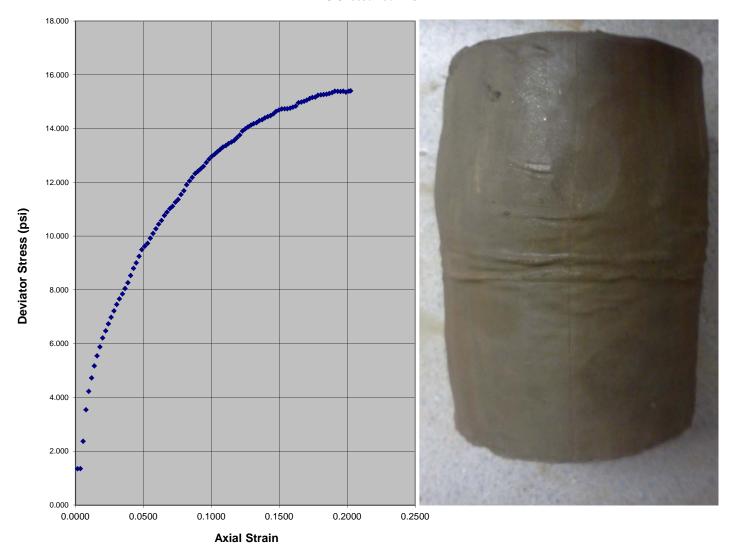
PROJECT		CA HST	
BORING #	S0073R; M	C11-1 Depth (ft)	46
DESCRIPT	ION	(SC) Clavey Sand	

TES #	23502-ZS9
Test Date	11/11/2013
Tested By	D. Carruba

Sample and Test Parameters

Wt. Specimen Wet + Tare (gm)	754.3	Water Content %	25.6	Diameter, D ₀ , (in)	2.41
Wt. Specimen Dry + Tare (gm)	600.6	Wt. Tare (gm)	0	Area, A ₀ , (in ²)	4.56
Wt. Water (gm)	153.7	Unit Wt. Wet (pcf)	127.5	Height, H_0 , (in)	4.94
Wt. Speciment Dry (gm)	600.6	Unit Wt. Dry (pcf)	101.5	Volume, V ₀ , (in ³)	22.53
Rate, in/min	0.05	Rate, %/min	1.00	Saturation, %*	104.8
Cell Pressure, psi	30	Axial Strain, %	20.25%	Deviator Stress, psi	15.40

*S.G. assumed 2.70





ASTM D2850

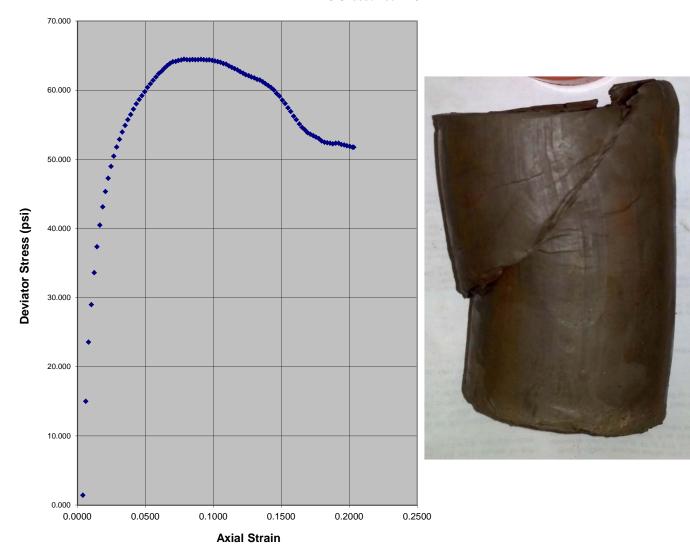
PROJECT	CA HST	
BORING #S0073R;	MC-15-1 Depth (ft)	66
DESCRIPTION	(CL)	

TES#	23502-ZS9
Test Date	11/11/2013
Tested By	D. Carruba

Sample and Test Parameters

Wt. Specimen Wet + Tare (gm)	772.9	Water Content %	22.3	Diameter, D ₀ , (in)	2.42
Wt. Specimen Dry + Tare (gm)	631.9	Wt. Tare (gm)	0	Area, A ₀ , (in ²)	4.60
Wt. Water (gm)	141	Unit Wt. Wet (pcf)	130.1	Height, H_0 , (in)	4.92
Wt. Speciment Dry (gm)	631.9	Unit Wt. Dry (pcf)	106.4	Volume, V ₀ , (in ³)	22.63
Rate, in/min	0.05	Rate, %/min	1.00	Saturation, %*	103.2
Cell Pressure, psi	60	Axial Strain, %	7.84%	Deviator Stress, psi	64.47

*S.G. assumed 2.70





California Bearing Ratio ASTM D - 1883

Project Number : 23502-ZS9

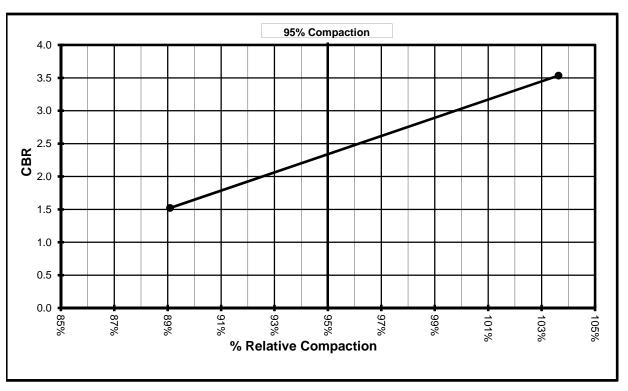
Project Name : HSR
Date : 11/1/13
Sample Location/Curve Number : S0073R
Sample Location/Curve Number : B01 @ 0-5'

Soil Classification : SM

Method of Compaction : ASTM D 1557 Method C

TEST	Α	В	С
Max Dry Density @ Optimum, lb/cu.ft.	120.0	120.0	120.0
Percent Moisture as Compacted, %	10.3%	10.2%	NA
Dry Density, lb/cu.ft.	106.9	124.4	NA
Percent Relative Compaction. %	89.1%	103.6%	NA
Surcharge Weight, lb	10	10	NA
Percent Moisture @ Testing %	11.4%	11.5%	NA
Penetration Depth Check, in	0.50	0.50	NA
Stress @ 0.1 / 0.2 " Penetration, psi	15	33	NA
Swell During Saturation, %	15.60%	13.35%	NA
CBR Value	1.5	3.5	NA

CBR @ 95% Relative Compaction 2.3





ASTM D - 1557

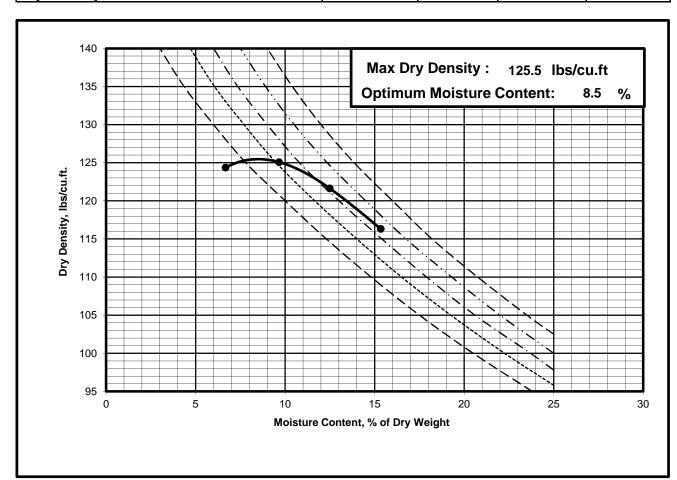
Project Number : 23502-ZS9

Project Name : HSR

Date : 11/1/2013 Sample location : S0073R

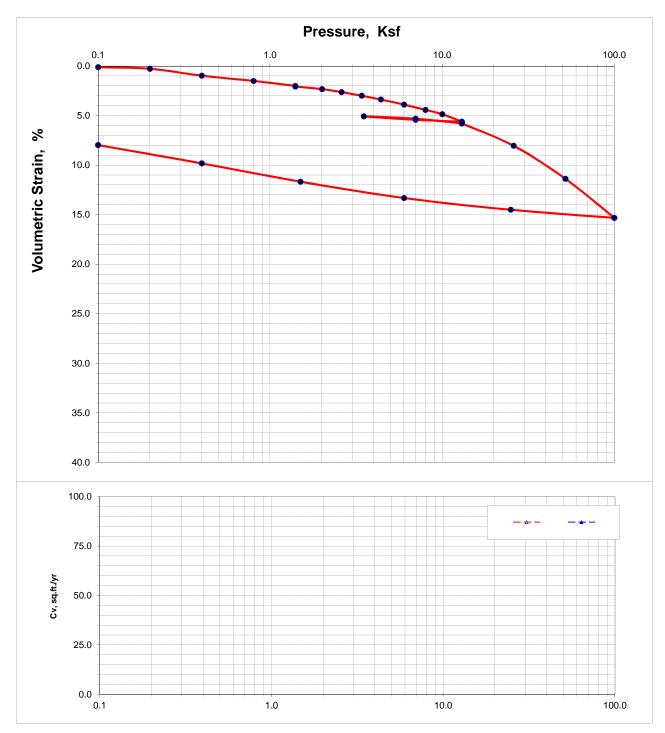
Sample/Curve Number : B01 Soil Classification : SM Test Method : 1557C

	1	2	3	4
Weight of Moist Specimen & Mold, gm	7420.7	7511.1	7522.3	7369.2
Weight of Compaction Mold, gm	2856.3	2856.3	2856.3	2856.3
Weight of Moist Specimen, gm	4564.4	4654.8	4666.0	4512.9
Volume of mold, cu. ft.	0.0750	0.0750	0.0750	0.0750
Wet Density, lbs/cu.ft.	134.2	136.8	137.2	132.7
Weight of Wet (Moisture) Sample, gm	200.0	200.0	200.0	200.0
Weight of Dry (Moisture)Sample, gm	173.4	177.8	182.4	187.5
Moisture Content, %	15.3	12.5	9.6	6.7
Dry Density, lbs/cu.ft.	116.3	121.6	125.1	124.4



CONSOLIDATION TEST

	Bori	ng Number	S0073R	Samp	ole Number	U04	Depth (ft)	12-14		
	Soil Description Grayish brown sandy clay									
		Water Content, %	Total Unit Weight, pcf	Void Ratio	Saturation %	Height in	Diameter in	Specific Gravity	Liquid Limit, %	Plasticity Index, %
Ī	Initial	24.1	124.0	0.689	94.7	1.00		(assumed)		
	Final	20.7	130.9	0.554	100.6	0.920	2.420	2.70		





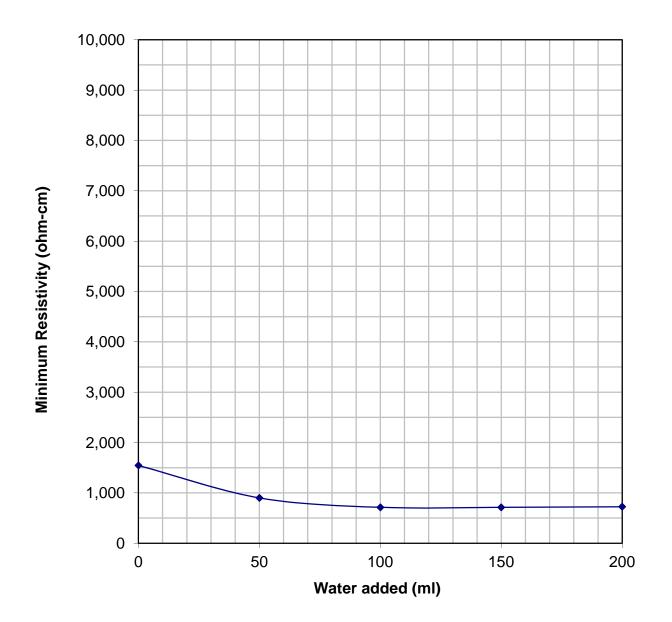
MINIMUM RESISTIVITY; ASTM G57

Project Name	CA HSR FRE_BAK	Sample Number	B01
Project Number	23502-ZS9	Sample Location	Boring S0073R
Sample Date	10/25/2013	Material Description	SM
Sampled By	M. Walker		

Sample Condition	As Received	Minimum Resistivity					
Water Added (ml)	0	50	100	150	200		
Resistance (ohm)	1,450	845	670	670	680		
Resistivity (ohm-cm)	1,544	900	714	714	724	0	0

Minimum Resistivity (ohm-cm)_714	Field Resistivity (ohm-cm)

PH=_9.92___ EC=___ Box Constant= 1.065



Chemical Analysis

 $\mathrm{SO_4} ext{-}$ Modified Caltrans 417 & CL - Modified Caltrans 417/422

SEG Project Number

: 1-513-0002

TES Project Number

: 23502-ZS9

Date

: 11/08/13

Sample Location

: S0073R: B01

Soil Classification

mple Number	Soluble Sulfate SO ₄ -S		Soluble Chloride Cl	
S0073R: B01	310	mg/Kg	81	mg/Kg
S0073R: B01	340	mg/Kg	80	mg/Kg
S0073R: B01	340	mg/Kg	82	mg/Kg
Average	330	mg/Kg	81	mg/Kg

